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Isotopic and magnetic provenance characterization of distal IRD in the Galicia Interior Basin (NW Iberia)

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The sediments of the Galicia Interior Basin in NW Iberia Margin are of particular palaeoclimatic interest as they are located at the boundary where the climatic oscillations of the glacial interval were interrupted by extreme events such as Heinrich events. These events are well characterized in Northern North Atlantic areas, but little is known about their occurrence beyond the Ruddiman belt.

This study presents a combined environmagnetic and geochemical approach to the provenance and characterization of distal ice-rafted detritus (IRD) that occurred during the last glacial period in core CI12PC3 from the Galicia Interior Basin.

The last six Heinrich Layers were identified by their magneto-mineralogical and geochemical properties. Their Sr and Nd isotopic signatures indicated that the Laurentide Ice Sheet was the major source for HL1, HL2, HL4 and HL5. However, the European ice sheets also influenced the initial development stages of HL1, HL2, HL4, HL3, HL6 and partially HL1, HL2 and HL4 were influenced by more juvenile provinces, such as Iceland/Faroes sheets and/or by the Fram Strait/East Greenland nearby areas. Separate provenance analyses of the coarse and fine fractions in the studied Heinrich Layers also indicated that IRDs and glacial flour sources might not always be the same. Our results shed unequivocal evidence that Canadian-sourced distal IRD are preceded by European-sourced IRD, at least from the H4. In our view, LIS and EIS instabilities registered in the Iberian Margin respond to the same climate forcing at different velocities.